

## **X-ray Heating of the Ejecta of Supernova 1987A**

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Analysis of Hubble Space Telescope B and R band images from 1994 to 2009 show that the optical luminosity of SN 1987A has transitioned from being powered by radioactive decay of  $^{44}\text{Ti}$  to energy deposited by X-rays produced as the ejecta interacts with the surrounding material (Larsson et al. 2011, *Nature*, 474, 484). The B and R band flux from the densest, central parts of the ejecta followed the expected exponential decline until 2001 (about day 5000) when the flux in these bands started increasing, more than doubling by the end of 2009. This increase is the result of heat deposited by X-rays from the shock interaction of the fast-moving outer ejecta with the inner circumstellar ring. In time, the X-rays will penetrate farther into the ejecta, enabling us to analyze the structure and chemistry of the vanished star.

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